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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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KATHRYN A MARRA  
General Motors Corporation  
Legal Staff, Mail Code 482-C23-B21  
P.O. Box 300  
Detroit, MI 48265-3000

EXAMINER	
JOHNSON, CHRISTINA ANN	
ART UNIT	PAPER NUMBER
1725	

DATE MAILED: 03/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/647,403

Applicant(s)

CAI ET AL.

Examiner

Christina Johnson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 25 August 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-2, 4-7, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iizuka et al. in view of Sung (2002/0131914).

Iizuka et al. (US 6,045,764) discloses an catalyst composition useful in the purification of exhaust gas and a process for making such a catalyst composition. The catalyst composition comprises Pt, Sr, a rare earth metal, and optionally Rh, supported in an inorganic oxide support such as alumina (column 2, lines 50-60). Preferred rare earth metals include cerium oxide (column 3, lines 1-5). The reference teaches that the catalyst is prepared by first supporting the rare earth metal, followed by strontium, platinum, and optionally rhodium, followed by calcination (column 3, lines 30-68). It is taught that the loading of the metals can be accomplished by dry kneading or impregnation (column 3, lines 40-45). It is taught that the dry kneading may be accomplished using an automatic mortar or ball mill, which is considered to meet the device required by claims 4 and 9. In an example, cerium nitrate crystals were dry mixed with a 6 micron alumina support, followed by impregnation with platinum nitrate solution, and drying and calcination (column 12, lines 25-40).

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The difference between the reference and the claims is that the reference does disclose that the cerium is loaded by "dry coating nanometer sized metal oxide particles on the surface of said alumina particles."

Sung (2002/0131914) discloses a catalyst composition useful in the purification of exhaust gas comprising an inorganic oxide support, a platinum group metal, and cerium oxide (claim 1). It is taught that the cerium oxide is added to the catalyst having an average particle size of not greater than about 100 nm, preferably 1-30 nm, most preferably 3-20 nm [0035], [0039]. It is taught that catalysts employing such a cerium oxide component have increased thermal stability and do not require excessive amounts of a platinum group metal in order to emission standards [0035].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method of Iizuka et al. to substitute the nanometer sized cerium oxide taught by Sung for the cerium nitrate employed in the examples. One of ordinary skill would have been motivated to do so because of the advantages taught by Sung, i.e. improved thermal stability and efficiency. Because both catalysts can be employed in the purification of exhaust gases from internal combustion engines, one would have reasonable expectation of success from the combination.

3. Claims 3 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iizuka et al. in view of Sung as applied to claims 1-2, 4-7, and 9 above, and further in view of Nara et al.

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The modified disclosure of Iizuka et al. is as described above for claims 1-2, 4-7, and 9.

The difference between the modified disclosure of Iizuka et al. and the claims is that the reference does not disclose that the dry coating step comprises repeatedly propelling a mixture of oxides and alumina particles against an impact surface at a high velocity.

Nara et al. (US 4,915,987) discloses a process for improving the quality of the surface of solid particles, such as by improvement of catalytic effects, by adhering fine particles on the surface of larger, mother particles by means of an impact striking device (column 1). The reference teaches that the use of such a device allows for a uniform stable coating in a short amount of time (column 3, lines 30-48).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have further modified the method taught by Iizuka et al. in light of the teachings by Nara et al. The Nara reference discloses an alternate known method of making the composite desired by Iizuka et al. One of ordinary skill would have been motivated to choose any known method of forming the composite, including the method taught by Nara, especially in light of the advantages disclosed therein. Because Nara et al. is directed towards improving solid surfaces, including those of catalysts, one would have a reasonable expectation of success from the combination.

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**Conclusion**

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christina Johnson whose telephone number is (571) 272-1176. The examiner can normally be reached on Monday-Friday, 7:30-5, with Alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on (571) 272-1171. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Christina Johnson  
Patent Examiner  
Art Unit 1725

3/11/05

CAJ  
March 11, 2005